Fair allocation of multiple resources using a non-monetary allocation mechanism

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Abstract: The fair allocation of scarce resources is relevant to a wide field of applications. For example, cloud resources, such as CPU, RAM, disk space, and bandwidth, have to be shared. This paper presents a mechanism to find fair allocations of multiple divisible resources, which, contrary to other mechanisms, is applicable to but not limited to the example above. Wide applicability of the mechanism is achieved by designing it (1) to scale with the number of consumers and resources, (2) to allow for arbitrary preference functions of consumers, and (3) to not rely on monetary compensation. The mechanism uses a mathematical definition of greediness to balance resources consumers receive and thereby to compute a fair allocation.

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